$$\text{Beta} = a\beta/2 \qquad (9)$$

and

$$F = (a\omega/2c)(Dr- 1)^{0.5}, \qquad (10)$$

where c is the speed of light, and Dr is the relative dielectric constant of dielectric channel 22. The range of operation is for values of f between 1 and 2 where there is only moderate dispersion.--

In The Drawing

One sheet of a proposed corrected drawing has been submitted. Figure 10 has been amended to remove the labels "Material A" and "Material B," as well as to remove the graph associated with "Material B." These corrections correspond to the amendments to the specification submitted above.

In The Claims

Please cancel claims 6 and 7-15 without prejudice.

Please amend the claims as follows:

1. (Once Amended) A backplane system, comprising:

a substrate;

a waveguide connected to the substrate, the waveguide having a gap therein

for preventing propagation of a lower order mode into a higher order mode;

at least one transmitter connected to the waveguide for sending an electrical signal along the waveguide; and

at least one receiver connected to the waveguide for accepting the electrical signal.

5. (Once Amended) The backplane system of claim 1, wherein the waveguide is an air-filled rectangular waveguide.

16. (Newly Added) The backplane system of claim 1, wherein the waveguide is a non-radiative dielectric waveguide.

17. (Newly Added) The backplane system of claim 1, wherein the waveguide comprises:

a first conductive channel disposed along a waveguide axis; and

a second conductive channel disposed generally parallel to and spaced from the first channel to thereby define the gap between the first and second channels along the waveguide axis, wherein the gap has a gap width that allows propagation along the waveguide axis of electromagnetic waves in a TE n,0 mode, wherein n is an odd number, but suppresses electromagnetic waves in a TE m,0 mode, wherein m is an even number.

18. (Newly Added) The waveguide of claim 17, wherein the first conductive channel has a generally I-shaped cross section along the waveguide axis.

19. (Newly Added) The waveguide of claim 17, wherein the first conductive channel has a generally C-shaped cross section along the waveguide axis.

20. (Newly Added) The waveguide of claim 17, wherein the first conductive channel comprises a bent sheet of electrically conductive material.

21. (Newly Added) The waveguide of claim 17, wherein the second conductive channel is generally C-shaped.

22. (Newly Added) The waveguide of claim 17, wherein the second conductive channel is generally I-shaped.

23. (Newly Added) The waveguide of claim 17, wherein the second conductive channel comprises a bent sheet of electrically conductive material.

24. (Newly Added) The waveguide of claim 17, further comprising:

a third conductive channel disposed generally parallel to and spaced from the first channel to thereby define a second gap between the first and third channels along the waveguide axis, wherein the second gap has a gap width that allows propagation along the waveguide axis of electromagnetic waves in a TE n,0 mode, wherein n is an odd number, but suppresses electromagnetic waves in a TE m,0 mode, wherein m is an even number.